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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Jae-Hyuk Eoh

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EXAMINER

PALABRICA, RICARDO J

ART UNIT

PAPER NUMBER

3663

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/677,941	Applicant(s) EOH ET AL.	
	Examiner Rick Palabrica	Art Unit 3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 December 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4 and 9-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4 and 9-15 is/are rejected.
- 7) ☒ Claim(s) 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's 12/6/07 Amendment, which directly amended claim 1, canceled claim 2, added new claims 10-15, and traversed the rejection of claims in the 6/6/07 Office action, is acknowledged.

Response to Arguments

2. Applicant traversed applied art, Hundal et al. , on the ground that they do "not disclose additional decay heat removal using Applicant's PVCS, as recited in amended claim 1 in case of failure of the normal heat removal system." Applicant argues that Hundal et al. do not have such passive vessel cooling system (PVCS) they teach "employing an insulating gas space (98) located outward annular space (93) in combination with an auxiliary heat exchanger to prevent the heat exchange between the upper portion of the reactor vessel (3) and hot liquid sodium in the hot pool plenum (41)." See Remarks, page 9, of the Amendment. The examiner disagrees.

As applicant himself admits, the insulating gas space only affects the heat exchange at the upper portion of the pressure vessel 3. Note that this pressure vessel is directly connected to basemat 15 through the annular support ring 16 (see Fig. 1). The amended claim recites:

"wherein the reactor vessel is also cooled by using a passive vessel cooling system."

Hundal et al.'s pressure vessel is inherently cooled by basemat 15 that is passive and cooling is by conductive heat transfer. Applicant has not defined the degree of cooling of

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the pressure vessel by the PVCS, and absent such definition, the examiner interprets the term broadly to apply to any and all degrees or amount of cooling that basemat 15 provides.

3. Applicant traversed applied art, Jogand-Hundal et al. combination on the grounds that: a) "it is not obvious for a person of ordinary skill in the art to combine Hundal's full passive heat removal system because Jogand's invention is not full passive decay heat removal system" (see Remarks, page 12 of the Amendment); and b) "[a]pplicants have discovered that heat removal methods recited in Applicant's claimed methods can remove heat at a significantly quicker speed than the heat removal structure disclosed in the combined teachings of Jogand in view of Hundal." (see Remarks, page 14 of the Amendment). The examiner disagrees.

As to argument a), the teaching from the secondary reference (Hundal et al.) that the examiner applied to supplement the primary reference (Jogand) is on the use of a sodium-air heat exchanger that is recited in line 11 of claim 1 (see section 6 of the 8/26/05 Office action). It is immaterial whether or not the primary and secondary references have different operational configurations for the heat removal system (i.e., full passive system for Hundal and partial passive system for Jogand). Both Hundal and Jogand need an ultimate heat sink that is provided for and taught by Hundal.

Thus, applicant has not shown that the references do not teach what the examiner has stated they teach, nor, has applicant shown that the examiner's reasoning for and manner of combining the teachings of references is improper or invalid.

As to argument b), applicant's argument is immaterial because the claims do not specify the rate of heat removal from the system in the claimed invention. If applicant considers this removal rate to be critical to his invention, then the claims would be rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements. See MPEP § 2172.01.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Hundal et al. .

The reasons are the same as those stated in section 3 of the 6/6/07 Office action, as further clarified in section 2 above, which reasons are herein incorporated.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jogand in view of Hundal et al.

The reasons are the same as those stated in section 4 of the 6/6/07 Office action, as further clarified in section 2 above, which reasons are herein incorporated.

6. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jogand in view of Hundal et al.

The reasons are the same as those stated in section 5 of the 6/6/07 Office action, as further clarified in section 3 above, which reasons are herein incorporated.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 10-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 10 recites the limitation, sodium-air heat exchanger into a sodium-sodium heat exchanger disposed within a circular vertical tube. There is insufficient antecedent basis for this limitation in the claim because not all liquid metal reactors have a sodium-air heat exchanger, a sodium-sodium heat exchanger and a circular vertical tube containing these heat exchangers. Additionally, not all liquid metal reactors inherently

use sodium. The claimed process does not inherently apply to all liquid metal reactors but to a specific reactor that has not been identified in the claim.

The same remark applies to claim 13 regarding the sodium-sodium heat exchanger and a circular vertical tube.

The same remark applies to claim 15 and the sodium-sodium heat exchanger, sodium collector and sodium-air heat exchanger.

Claim Objections

8. Claim 15 objected to because of the following informalities: line 9 of the claim recites a “heat sodium collector”, which appears to be a typographical error. Appropriate correction is required.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick Palabrica whose telephone number is 571-272-6880. The examiner can normally be reached on 6:00-4:30, Mon-Thurs.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

January 23, 2008

/Rick Palabrica/
Primary Examiner, Art Unit 3663